

## PROCEEDINGS OF THE CLUB

MEETING OF OCTOBER 18, 1939

The meeting of the Torrey Botanical Club held at the New York Botanical Garden on Wednesday, October 18, was called to order by the President, Dr. Arthur H. Graves, at 3.30 p.m.

Twenty-four members and friends were present.

The following were elected to annual membership: Mr. J. Horace Hatfield, Scotch Plains, N. J.; Mr. William E. Roever, Dept. of Bot., Rutgers Univ., New Brunswick, N. J., and Dr. Fred M. Schellhammer, 1610 Lurting Avenue, Bronx, New York.

Mr. Leonard W. Steiger, 835 Summit Ave., Hackensack, N. J., was elected to associate membership.

Dr. H. K. Svenson gave an interesting talk on Flowers of Middle Tennessee which was illustrated by colored slides. Dr. Svenson's abstract follows:

"Photographs in natural color were presented showing types of the flora of three sections of Tennessee: the cedar glades of Middle Tennessee, the Cumberland Plateau, the Great Smokies.

The cedar glades have a remarkable percentage of endemic plants which seem to be related to, and are sometimes identical with, plants of prairies west of the Mississippi River. Among the plants which were illustrated were *Psoralea subacaulis*, *Astragalus tennesseensis*, *Lobelia Gattingeri*, *Petalostemum Gattingeri*, *Leavenworthia* sp. The cedar glades, which are flat and dry limestone exposures east of Nashville, were formerly covered by extensive groves of red cedar. Nearly all of the sizable trees have been cut down for the manufacture of lead pencils during the last fifty years, so that only a scrub growth remains. These cedar glades occupy the central part of the Nashville Basin, which is bounded on all sides by an escarpment about five hundred feet high known as the Highland Rim, which forms the border of a fairly level plateau.

On the flat surface of this plateau [also known as the Highland Rim], chiefly in Coffee Co., occurs a great assemblage of plants usually found only on the Atlantic Coastal Plain. Among the plants illustrated from this area were *Sabatia campanulata*, *Lilium superbum*, *Habenaria cristata*, *H. ciliaris*, *H. integra*, *Phlox glaberrima*.

To the east of the Highland Rim rises the escarpment of the Cumberland Plateau, the base formed of limestone, the upper layers of resistant sandstones. In flat places on the sandstone are also coastal plain plants similar to those of the Highland Rim. The ravines of the Cumberland Plateau have a wealth of holly, *Magnolia macrophylla*, *Stewartia*, *Xanthorrhiza*, and a number of interesting herbaceous plants such as *Boykinia* and *Saxifraga Grayana*.

The summits of the Great Smoky Mountains represented the third area (exploration in company with Dr. Jennison), pictures being shown of *Solidago glomerata*, *Impatiens*, and some of the large stands of timber.

CLYDE CHANDLER  
Recording Secretary

MEETING OF NOVEMBER 6, 1939

The regular meeting of the Torrey Botanical Club held on November 6 at the American Museum of Natural History was called to order at 8.30 by the President.

Forty-seven persons were present.

The following were elected to annual membership in the Club:

Dr. Alphonse L. Heun, 3401 West Wisconsin Ave., Milwaukee, Wis.; Dr. B. W. Wells, Dept. of Bot., N. C. State College, Raleigh, N. C.; Dr. Ernst E. Naylor, N. Y. Bot. Gard., Bronx Park, New York; Dr. Paul A. Young, Tomato Disease Laboratory, Jacksonville, Texas; Dr. Virgene W. Kavanagh, N. Y. Bot. Gard., Bronx Park, New York; Mr. Frederick Kavanagh, N. Y. Bot. Gard., Bronx Park, New York; Prof. Arthur W. Haupt, Dept. of Bot., Univ. of Calif., Los Angeles, Calif., and Mr. Victor R. Larsen, 636 W. 174th St., New York.

The resignation of Mr. Jonathan Gordon, 361 Sterling Place, Brooklyn, New York, was accepted with regret.

It was voted by the Club to have the annual meeting held on January 9, 1940 instead of January 2 so that annual reports can be completed more easily after the close of the Club year on December 31.

The scientific program of the evening consisted of a lecture by Dr. B. O. Dodge on Mendelism in Fungi. The speaker's abstract follows:

"In genetic studies of higher plants and animals the effects of factors of inheritance are usually manifested in connection with diploid structures. In the fungi most of the morphological features are found in connection with haploid structures, so the effects of a single set of genes may be studied. The bakery molds of the genus *Neurospora* are excellent material for genetic studies. Lindgren was the first to point out that second division segregation with the development of four genotypically different kinds of spores in an ascus were measures of crossing-over percentages. Those who have worked genetically with smuts and mushrooms have assumed that disjunction of homologous chromosomes may occur either in the first or second division to account for the four types of spores developed at reduction of the zygote

nucleus. No doubt the discovery of linkage relations with crossing-over in these forms would go a long way to explain the principles underlying the segregation of the factors governing sex reactions in these forms.

Genetic studies by Burgeff with *Phycomyces* have proved that there is only one nuclear fusion at the formation of the zygospore, a point about which there has been much discussion among cytologists. The question of double fertilization and double reduction in the Ascomycetes can be settled very easily by finding that there may be eight genotypically different kinds of spores developed in an ascus, or that, where the spores are arranged serially in asci, the spores alternate one and one for some pair of factors.

The industrial yeasts that were long thought to develop asci parthenogenetically have been proved by Winge and his associates to reproduce sexually. They have already developed fourteen hybrid yeasts. The slime flux yeast has been shown by them to be excellent material for genetic studies. The segregation of three pairs of factors in the ascus is Mendelian. On the basis of morphological differentiation this yeast has male and female races according to the criteria of some of our mycologists. These size differences are no doubt merely morphological differences that are sex linked. With crossing-over and new combinations, the falsity of such an assumption will be made clear.

Other examples of Mendelian inheritance in the bakery molds, slime flux yeasts, smuts and mushrooms were illustrated. A more complete account of the address is being prepared for publication elsewhere."

CLYDE CHANDLER  
Recording Secretary

#### MEETING OF NOVEMBER 15, 1939

The meeting of the Torrey Botanical Club held at Columbia University on November 15 was called to order by the President at 3.30 p.m.

Nineteen persons were present.

The minutes of the meeting on October 18 and November 6 were accepted as read.

It was moved by Dr. B. O. Dodge and seconded by Dr. J. S. Karling that the secretary cast a unanimous ballot for the election of Mrs. Kathleen Goddard Shirazi, 34 East 64th Street, New York, and Miss Gretchen D. Taylor, 127 Prospect Place, South Orange, N. J., to associate membership.

The resignation of Mr. Jerome Metzner, 1815 Morris Avenue, New York, was noted with regret.

The scientific program consisted of a talk on "Wound healing in higher plants" by Dr. R. Block of Columbia University. The author's abstract follows:

"The introductory part of this report dealt with the various cases of artificial and natural wounds in higher plants and with the description of contrasted types of wound healing and structural regeneration in organs and tissues of different structure and reactivity. The stages in the readaptation process of cells in wound tissues: dedifferentiation, cell growth and division and redifferentiation were described. The histological and metabolic changes during wound meristem activity and the effects of external and internal factors on cell division and differentiation, such as polarity, light, temperature, oxygen, water, pH, food distribution, enzymes and growth substances were discussed. The effects of necrotic and necrobiotic changes in the wound area on processes of cell division, and of normal or pathological dedifferentiation in adjacent cells were discussed in conjunction with the hormone hypothesis. A brief history of the concept of the wound hormone and its experimental isolation was given.

In many cases tissues comparable to wound tissues can be produced by an extreme change in external conditions, for example by high humidity (hyperhydric tissues, such as lenticel proliferations and intumescences), by darkening parts of the shoot, and by chemical stimulation (e.g. callus and adventitious root formation).

Wounding, therefore, may be regarded as one way of disturbing the normal physiological continuity of a plant and setting into motion a regulating reaction mechanism, of which, for example, structural regeneration is one visible expression. The question as to the exact interaction and nature of the factors concerned in this control must at present remain unanswered, but for the process of restoration of anatomical features at and near the surface of wounded organs a casual explanation seems available. Certain layers of cells below the wounded surface become meristematic, and this portion of the organ resumes development in so far as thickening of cell walls and condensation and oxidation processes near the surface produce histological and chemical characters similar to those developing during normal differentiation of the organ.

A brief discussion of the characteristics of plant-neoplasms, chemical and bacterial tumors, so-called spontaneous tumors of hybrids, and of insect galls concluded the lecture."

CLYDE CHANDLER  
Recording Secretary

#### MEETING OF DECEMBER 5, 1939

The meeting of the Torrey Botanical Club, held at the American Museum of Natural History on December 5 was called to order by the President at 8.15 p.m.

Fifty-seven members and friends were present.

The following were elected to annual membership: Dr. A. R. Bechtel, Wabash College, Crawfordsville, Ind.; Dr. J. F. Brenckle,

Mellette, S. Dak.; Dr. Ray J. Davis, University of Idaho, Southern Br., Pocatello, Idaho (transfer from associate); Dr. Henry P. Hansen, Department of Botany, Oregon State College, Corvallis, Ore.; Mr. Thomas Laskaris, N. Y. Botanical Garden, Bronx Park, New York; Dr. Gualterio Looser, Casilla 5542, Santiago, Chile; and Mr. William Lucian, Bishop St., Waterbury, Conn.

The following were elected to associate membership: Mrs. Werner Hartmann, 1 Bank Street, New York (transfer from annual membership); Miss Wilhelmine Meissner, 29-20 215th Place, Bayside, N. Y.; Prof. J. E. Weaver, University of Nebraska, Station A, Lincoln, Neb.; and Mrs. Merrill Willett (Leone N.), 210-21 29th Avenue, Bayside, N. Y.

The resignations of Sr. J. P. Carabia, c/o Hno. Leon, Colegio de la Salle, Vedado, Havana, Cuba; Miss Genevieve Clulo, West Virginia, Morgantown, W. Va.; Dr. Howard A. Kelly, 1406 Eutaw Place, Baltimore, Md.; Dr. Susan P. Nichols, 75 Elmwood Place, Oberlin, O.; Miss Irene Nelson, 524 East 236th Street, New York; and Miss Martha H. Hollinshead, 504 Camden Avenue, Moorestown, N. J., were noted with regret.

The deaths of Dr. William H. Brown, Johns Hopkins University, Baltimore, Md., and Mr. Arthur N. Leeds, 1025 Westview Ave., Germantown, Philadelphia, Pa., were reported to the Club.

The scientific monthly lecture was delivered by Dr. Michael Levine of the biological laboratories devoted to cancer research at the Montefiore Hospital, who presented a popular version of his studies on chemical tumors of plants. The following is an abstract of Dr. Levine's lecture.

"With the discovery of tar cancer in animals, attempts have been made to produce cancer by chemical means on plants.

Plants are known to harbor a form of cancer known as crown gall. This disease is produced on common economic plants by the introduction into wounds made by farm implements, of a bacterial soil organism known as *Phytoplasma tumefaciens*. Crown gall is not analogous to human or animal cancer, but represents a new type of neoplasm such as plants only could produce when stimulated by the toxins produced by a parasite. Under experimental conditions these plant tumors possess the ability to invade the vital tissue of the plant and so destroy it. Under these conditions the plant cell multiplies for many cell generations. A large localized mass of "tumor" tissues is formed on the surface of the plant. The cell multiplication, however, is due to the presence of the bacteria. Cell proliferation is nevertheless limited. The tumor grows old and dies. Most frequently, however, it may be pointed out that these growths are harmless and play no rôle in the plant economy.

The carcinogenic hydrocarbons which produce cancer in animals are poisonous to plants and fail to produce cancer. Certain irritating substances like indole acetic acid, indole butyric acid, naphthalene acetic acid and a series of scarlet red dyes, when applied to the injured surface of a plant produce roots together with small tumors. These chemical tumors have been intensively studied. On certain plants these irritating substances produce tumors which, but for size, are identical, microscopically, with those produced by the bacteria, *Phytomonas tumefaciens*. The cells seem to be stimulated to proliferate or multiply as long as the bacteria function. The chemical agents applied to an injured stem seem to induce the cells in this area to multiply. These stimulating effects are soon worn off. Repeated treatments under present experimental conditions, result only in limited growths. The applications of vitamin B1 and growth substances do not affect the multiplication of the first stimulated cell. Like crown gall tissue, these small growths become old, turn into wood or cork, and die.

The speaker believes that the plant tumor is a part of a reparative and protective mechanism of the plant. These plant responses are analogous to inflammation in the animal. It is hoped that plants ultimately will be made to form tumors as a response to chemical substances, where the plant cells will be so modified as to proliferate without limit, endowing them with a property now possessed by animal cancer. The production of malignant plant growths will throw light on the mechanism of cancer production in animals. The absence of blood and lymph streams, and lack of diversity of tissue types make the plant a suitable subject for the study of this important problem."

CLYDE CHANDLER  
Recording Secretary

#### MEETING OF DECEMBER 20, 1939

The meeting of the Torrey Botanical Club held on December 20, 1939 at The New York Botanical Garden was called to order by the President at 3.30 p.m.

Thirty-one persons were present.

The minutes of November 15 and December 5 were adopted as read.

It was moved by Dr. Dodge and seconded by Dr. Karling that the secretary be instructed to cast a unanimous ballot for the election of the following members:

Annual: Mrs. William L. Skelton, 524 High Street, Bath, Me.; Dr. Fred T. Wolf, Biology Dept., Vanderbilt University, Nashville, Tenn.; Miss Ruth Ann Bobrov, 1879 Prospect Ave., New York; Prof. F. M. Pagan, Dept. of Bot., University of Michigan, Ann Arbor, Mich.; and Miss Agnes Beschnitt, 10765 117th St., Richmond Hill, N. Y.

Associate: Miss Louise M. Edelson, 1488 East 17th St., Brooklyn, New York.

The following resignations from annual membership were noted with regret:

Mrs. Spencer Scott Marsh, Midwood Terrace, Madison, N. J.; Dr. Takewo Hemmi, College of Agriculture, Phytopathological Institute, Kyoto Imperial University, Kyoto, Japan; and Prof. Fanchon Hart, College of Pharmacy, Columbia University, New York.

It was suggested by Dr. Karling that the Treasurer obtain resolutions from the Savings Banks so that they may be presented at the Council meeting of January 9 so that a special meeting of the Council need not be called for a hearing of said resolutions.

The scientific lecture on "The Response of the Chicle Tree to Bleeding in British Honduras" was presented by Dr. J. S. Karling. The speaker's abstract follows:

"*Achras zapota* when tapped by the ibidem method employed on *Hevea brasiliensis* shows no response in the form of greater latex yield. The first incision drains all of the latex for a distance of approximately 16 inches above and below. Trees tapped daily by the ibidem method over a period of twelve weeks yielded no latex after the first day."

CLYDE CHANDLER  
Recording Secretary

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## NEWS NOTES

At the Columbus meeting of the American Association for the Advancement of Science Dr. Albert F. Blakeslee, director of the department of genetics of the Carnegie Institution of Washington at Cold Spring Harbor, Long Island, was elected president for 1940. As Dr. Blakeslee has long been an active member of our club and served as president in 1933, we feel that we share in the honor shown him.

At the same meeting Dr. M. L. Fernald, of Harvard, was elected vice-president and chairman of the Botanical Section and Dr. W. J. Robbins, of the New York Botanical Garden, a member of the Sectional Committee for Botanical Sciences. Dr. E. N. Transeau, of Ohio State University was elected president of the